

## Patent Abstracts of Japan

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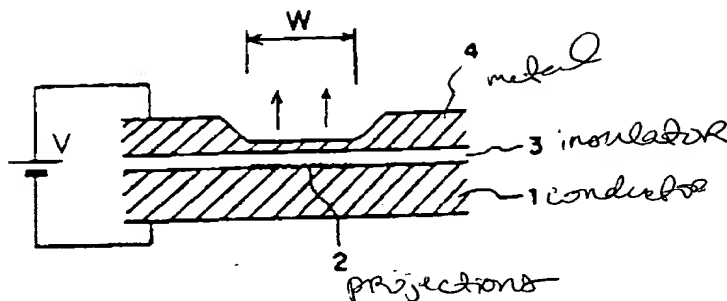
APPLICATION DATE : 20-05-86  
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TITLE : ELECTRON EMITTING ELEMENT



**ABSTRACT :** PURPOSE: To exceedingly improve the efficiency in an electron emission by forming minute projections on the electron emitting surface of a conductive material at the interface between the insulating layer and the conductive material.

**CONSTITUTION:** When a voltage V is applied between a conductive material 1 and metal 4, a strong electric field is generated on minute projections 2. Electrons emitted from the minute projections 2 tunnel through an insulating layer 3 and are emitted from the electron emitting portion W of the metal 4. The tunneling electrons accelerated by the strong electric field has high enough to exceed the energy level in vacuum regardless of the scattering and energy loss in the insulating layer 2 and metal 4. Since a high probability of having the energy electric field is concentrated at the minute projections 2 and the concentration of the electric field at other portions is softened, almost no current flows which does not contribute to the electron emission. Therefore, it is possible to exceedingly improve the efficiency in the electron emission.

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